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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/761,992	01/21/2004	Jhy-Jyi Sze	JCLA11796	4307

23900 7590 07/21/2005

J C PATENTS, INC.
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EXAMINER

MULPURI, SAVITRI

ART UNIT PAPER NUMBER

2812

DATE MAILED: 07/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/761,992	SZE ET AL.	
	Examiner	Art Unit	
	Savitri Mulpuri	2812	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 March 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

This action is in response to the applicant's communication filed on 3/28/2005.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over
Admitted prior art in combination with Rhodes et al (US 2004/0178430)

Admitted prior art teaches a method of making image sensor by the following process steps: Providing a substrate having plurality of trenches; forming liner layer on the surface of the trenches ; filling insulation layer in the trenches to form isolation regions; forming at least one photosensitive region with the in the substrate between two neighboring isolation regions; forming anti-reflection layer by chemical vapor deposition method, at least covering the photo sensitive region. Admitted prior art teaches forming photosensitive regions by implantation (see fig 1 A-1 B and related description).

Admitted prior art does not teach forming antireflection layer between liner layer and filling layer. Rhodes et al teaches a method of making image sensor by forming silicon oxide/silicon nitride layer "154" in the trench before filling the trench with

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insulation material "150". Rhodes especially mention forming silicon nitride layer to smoothing out the corners in the trench and to reduce stress with in the trenches (see fig. 10fig.13 and fig. 16 and related description para 0044). It would have been obvious to one of ordinary skill in the art to form additional layer of nitride in the invention Admitted prior art to reduce stress, which would built due to filling of the insulation material within in the trench. It is well known in the art that nitride layer is acts as anti-reflection layer (see Hong et al US 6,251,746, col.5, lines 57-60col.6, lines 64-68).

Response to Arguments

Applicant's arguments filed 3/28/2005 have been fully considered but they are not persuasive. Applicant argues that though Admitted prior art mention light reflection problem, Rhodes do not mention to form anti-reflection layer in the shallow trench isolation to overcome the reflection problem of the image sensor and also do not teach insulating layer 154 possess the functionality of anti-reflection so as to overcome reflection problem happening around the shallow trench isolation . However, Rhodes et al teaches forming image sensor, as similar to admitted prior art, with photodiode and transistors with trench isolation regions. Rhodes teaches oxide/ nitride layer "154" to smoothing out the corners and to reduce stress with in the trench and then filling with material '350". It is agreed with the applicant that Rhodes do not mention nitride being anti-reflection layer, which can resolve the issue of light reflection at the bottom and sidewalls of the shallow trench isolation regions when incident light pass through the shallow trench isolation regions. However, the modified invention of Admitted prior art,

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as modified by the teaching of Rhodes would not have light reflection when light passes through the shallow trench isolation regions because it is well known that nitride acts as anti-reflection layer. In other words, It would be inherent that the modified invention of admitted prior art as modified by the teachings of Rhodes, that there would not be any light reflection in addition to smoothing the corners and reducing the stress. It is well known in the art that nitride layer is acts as anti-reflection layer (see Hong et al US 6,251,746).

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Savitri Mulpuri whose telephone number is 571-272-1677. The examiner can normally be reached on Mon-Fri from 8 a.m. to 4.30 p.m.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Lebentritt, can be reached on 571-272-1873. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Savitri Mulpuri
Primary Examiner
Art Unit 2812